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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/522,397

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Bernard Beaumont

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03/18/2008

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EXAMINER

CHAET, MARISSA W

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

03/18/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/522,397	Applicant(s) BEAUMONT ET AL.	
	Examiner Marissa W. Chaet	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3-18 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-18 and 20-22 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1, 3-9, 12-13, 15, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Motoki et al. (2002/0028564).**
2. Regarding claim 1, Motoki discloses a process for making a GaN film starting from a substrate (10) by depositing GaN by vapor phase epitaxy, such that the GaN deposit comprising at least one vapor phase epitaxial lateral overgrowth step, and at least one ELO step is preceded by the etching of openings (12) in a previously deposited dielectric mask (11). See Fig. 4; para. 22-28.
3. Regarding claim 3, Motoki discloses making openings in the dielectric mask that form a basic pattern of a periodic network comprising at least 2 openings. See Fig. 2, 3; para. 318.
4. Regarding claim 4, Motoki discloses openings that are round, striped (rectangular), or other polygon shape. See Fig. 2, 3; para. 25-26.
5. Regarding claim 5, Motoki discloses a periodic network extending along the [10-10] axis. See Fig. 2; para. 28.
6. Regarding claim 6, Motoki discloses ELO steps that are made by HVPE. See para. 23.

7. Regarding claim 7, Motoki discloses ELP steps done along the C(0001), M(1-100) and A(11-20) planes. See para. 66.
8. Regarding claims 8-9, Motoki discloses a GaAs or sapphire substrate. See para. 27.
9. Regarding claim 12, Motoki discloses openings that are etched in a dielectric mask. See para. 27.
10. Regarding claim 13, Motoki discloses GaN base layer is made by HVPE. See para. 23.
11. Regarding claim 15, Motoki discloses a process comprising 2 ELO steps, the GaN deposition during the first step made in GaN zones located in the openings, and the GaN deposition during the second step leads to lateral overgrowth until coalescence. See Fig. 4(1)-(4); para. 323-329.
12. Regarding claim 21, Motoki discloses an optoelectronic component. See para. 9.
13. Regarding claim 22, Motoki discloses a laser diode made from GaN film. See para. 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. **Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al. (2002/0028564) in view of Okuyama et al. (US 2002/0117677).**

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15. Regarding claim 10, Motoki does not disclose doping GaN. However, Okuyama discloses silicon and magnesium-doped GaN. See para. 3. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Motoki to include magnesium-doped GaN, as suggested by Okuyama, to form a p-type cladding layer.

16. Regarding claim 11, Motoki does not disclose an isoelectric impurity. However, Okuyama discloses introducing Indium to GaN. See para. 200. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Motoki to add Indium to GaN, as suggested by Okuyama, to form an active layer.

17. Claims 14, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al. (2002/0028564) in view of Beaumont et al. (US 6,802,902).

18. Regarding claim 14, Motoki discloses the formation of the GaN base layer comprising: deposition of SiN (para. 25), deposition of GaN buffer layer, high temperature annealing at about 1020°C, and deposition by epitaxy of GaN. See para. 323-329. Motoki does not disclose the thickness of the SiN. However, Beaumont discloses SiN film with a thickness of 1 angstrom, approximately equal to one atomic plane. See col. 8, lines 20-31. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Motoki to include SiN thickness at the atomic level, as suggested by Beaumont, to avoid etching of the masks by expensive techniques.

19. Regarding claim 16-17, Motoki does not disclose growth rates. However, Beaumont discloses the first ELO step having a growth rate along the <0001> direction,

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and the second ELO step having a lateral growth rate greater than <0001> by adding magnesium. See col. 6, line 65 - col. 7, line 20. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Motoki to include add magnesium during ELO, as suggested by Beaumont, to act as a surfactant, favoring the adsorption of gallium on certain faces and preventing it on other faces.

20. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al. (2002/0028564).

21. Regarding claim 18, Motoki discloses openings being etched in a mask. However, it would have been obvious to one of ordinary skill in the art at the time of invention to etch openings into the substrate to be more efficient.

22. Regarding claim 19, Motoki does not disclose implementing the process for making GaN according to operation conditions. However, it would have been obvious to one of ordinary skill in the art at the time of invention to make GaN according to operation conditions for consistency purposes.

23. Regarding claim 20, Motoki discloses GaN film with a thickness of 200-600 micrometers. See para. 42. However, it would have been obvious to one of ordinary skill in the art at the time of invention to produce thinner film with a thickness of between 1-20 micrometers.

Allowable Subject Matter

Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Motoki does not apply an electric field to vary growth parameters.

Response to Arguments

Applicant's arguments, filed November 13, 2007, with respect to claim 2 have been fully considered and are persuasive. The rejection of claim 2 has been withdrawn.

Applicant argued that Motoki discloses symmetrical shapes, rather than asymmetrical configurations. However, the asymmetry mentioned in claim 1 does not further limit the claim.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa W. Chaet whose telephone number is 571-272-8094. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina A. Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MWC
March 11, 2008

/Robert M Kunemund/
Primary Examiner, Art Unit 1792